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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,120	06/23/2003	Hadj L. Mokeddem	P16169	1101

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EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/602,120	MOKEDDEM, HADJ L.	
	Examiner	Art Unit	
	Joseph Chang	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *20 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *15-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 25-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-38* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Claims 1-14, 25-38 drawn to species 1 in the reply filed on 7/22/04 is acknowledged.

Claims 15-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/22/04.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: CHARGE PUMP FOR ELIMINATING DC MISMATCHES AT COMMON DRAIN NODES.

Claim Objections

Claims 13 and 14 are objected to because of the following: the recitation "an output" in both claims have already been mentioned in the independent claim 8, and therefore it should be --the-- since there are no other outputs in the operation amplifier. Furthermore, Claims 13 and 14 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 8. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 and 25-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Girard et al. (US 5760640).

Regarding Claim 1, Girard et al. disclose in Figure 3 a charge pump (bi-direction current sources - charging and pumping currents) comprising: a first PMOS transistor (T6); a first NMOS transistor (T7) coupled to the first PMOS transistor (T6) via a first common drain node (14); a second PMOS transistor (T8); a second NMOS transistor (T9) coupled to the second PMOS transistor (T8) via a second common drain node (15); a first current source (T2) coupled to respective source terminals (16) of the first and second PMOS transistors (T6,T8); a second current source (T5) coupled to respective source terminals (17) of the first and second NMOS transistors (T7, T9); a first operational amplifier (OP1)having a first input ("+", not shown) coupled to the first common drain node (14) and a second input ("-", not shown) coupled to the second common drain node (15) (a feedback line connecting from the output of the OP1 to the inverting side of the inputs (not shown) is inherently present because the OP1 is to maintain its gain equal to one i.e. a voltage follower)(Col.1, lines 55-60); a reference

circuit (T1,T3,T10,20,T11,T12); and a second operational amplifier (OP2) having a first input ("-") coupled to the first common drain node (14, via OP1) and a second input ("+") coupled to the reference circuit (20).

Regarding Claim 2, a capacitor coupled to the first common drain node (14, output of the charge pump) is inherently and necessary present because the capacitor at the output of charge pump is to charge or pump the currents from the current sources.

Regarding Claim 3, Figure 3 shows the reference circuit includes: a third PMOS transistor (T10); a third NMOS transistor (T11) coupled to the third PMOS transistor (T10) via a third common drain node (20); a third current source (T3) coupled to a source terminal (source of T10) of the third PMOS transistor (T10); and a fourth current source (T12) coupled to a source terminal (source of T11) of the third NMOS transistor (T11); wherein the second input ("+") of the second operational amplifier (OP2) is coupled to the third common drain node (20).

Regarding Claim 4, Figure 3 shows the first current source (T2) is a PMOS current Source.

Regarding Claim 5, Figure 3 shows the second current source (T5) is an NMOS current source.

Regarding Claim 6, Figure 3 shows an output of the first operational amplifier (OP1) is coupled to the second common drain node (15).

Regarding Claim 7, Figure 3 shows an output of the first operational amplifier (OP1) is coupled to a gate terminal of the first current source (T2, via switching circuit

12 and T5). It is noted that the recitation "coupled to" is a broad term that any points in a given circuitry are considered "coupled to" unless there is a modifier such as "directly" coupled to.

Regarding Claim 25, Girard et al. discloses in figure 3, a charge pump (bi-direction current sources - charging and pumping currents) comprising: an output terminal (I out); a first element (T6) to control charging of the output terminal (14); a second element (T7) to control discharging of the output terminal (I out) and including a common node (14, same as the output terminal) with the first element (T6); a reference circuit (T1, T3, T10, 20,T11, T12); and an operational amplifier (OP2) including a first input ("-") coupled to the common node (14 via OP1) and a second input ("+") coupled to the reference circuit (20).

Regarding Claims 26 and 27, Figure 3 shows the first element (T6) comprises a PMOS transistor and the second element (T7) comprises an NMOS transistor.

Regarding Claim 28, Figure 3 shows the reference circuit includes: a first transistive element (T10); a second transistive element (T11) coupled to the first transistive element (T10); a first current source (T3) coupled to the first transistive element (T10); and a second current source (T12) coupled to the second transistive element (T11).

Regarding Claim 29, Figure 3 shows the first transistive element (T10) comprises a PMOS transistor and the second transistive element (T11) comprises an NMOS transistor.

Regarding Claim 30, Figure 3 shows the first and second transistive elements (T10, T11) include a common drain node (20); and the second input ("+") of the operational amplifier (OP2) is coupled to the common drain node (20).

Regarding Claims 31, Figure 3 shows a second output terminal (15), and a second operational amplifier (OP1) including a first input coupled to the common mode (14) and a second input coupled to the second output terminal (a feedback line connecting from the output of the OP1 to the inverting side of the inputs (not shown) is inherently present because the OP1 is to maintain its gain equal to one as a voltage follower)(Col.1, lines 55-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8-14, 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momtaz et al. (US 5950115) in view of Girard et al.

Regarding Claims 32-38, Momtaz et al. discloses in Figures 1-3 an apparatus (transceiver) a communication port (Dout or Din) and a serializer/deserializer (32, 38) coupled to the communication port (Dout or Din) serializer/deserializer (32, 38) including a phase locked loop (20, 28) except for a specific charge pump as discussed above in claim rejections 1-7, 25-31 as being anticipated by Girard et al.

Girard et al. further teaches that his chare pump provides a highly symmetrical bi-directional current sources so that it eliminates unwanted potential differences exist in a conventional charge pump, and also it provides excellent impedance matching at all paths between supply voltages.

Accordingly, it would have been obvious to one of ordinary skill in the art to at the time of the invention to substitute a charge pump, as taught by Girard et al, for the charge pump of Momtaz et al. because such modification would have provided a highly symmetrical bi-directional current sources so that it eliminates unwanted potential differences exist in a conventional charge pump as taught by Girard et al..

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Desortiaux discloses a load pump (charge pump) having both a positive and a negative bias adjustment for its potential difference errors.

Momtaz discloses an operational amplifier connecting two common drain nodes functioning as a voltage follower to maintain the same potential at the nodes.

Si discloses a current-steering charge pump circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Chang whose telephone number is 571 272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph Chang
Patent Examiner
Art Unit 2817

JC